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SOCIOCOMMUNICATIVE PERFORMANCE IN CHILDREN WITH ASD

An Analysis from Transcurssive Logic

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ABSTRACT

Socio-communicative performance in children with ASD. An analysis from Transcurssive Logic. The purpose of this paper is to review the neurobiological and psychological foundations of the so-called Theory of Mind (ToM), whose alleged flaws in its development pretend to explain the appearance of the socio-communicative disorders presented by people with Autism Spectrum Disorder (ASD) in order to shed some light on the appearance of some signs such as, for example, the non-social features of autism. From a critical analysis of some contributions from the Cognitive Sciences, we conclude that the Theory of Mind is an inappropriate model to assess language comprehension because it does not consider its subjective aspects. Transcurssive Logic, on the other hand, provides an interpretation of the communicative process and thus demonstrates the inappropriateness of the Theory of Mind.

Keywords: autism, Theory of Mind, mirror neurons, language comprehension, communicative process, transcurssive logic.

1.0. INTRODUCTION

Research by cognitive psychologists and psycholinguists suggests that sociocommunicative deficits in children with Autism Spectrum Disorders (ASD) are grouped into two broad areas: 1) The ability to pay attention, which is reflected in difficulty coordinating attention between subject and object; and 2) The ability to use symbols, which is evidenced by difficulty learning conventional or shared meanings of symbols, especially in the acquisition of gestures, words, imitation, and play (Wetherby, 2006).

The ability to pay attention is based, according to this school of thought, on the acquisition by the child of three achievements that allow him/her to be valid interlocutors for learning to speak: a) sharing attention, b) sharing affection, and c) sharing intentions (Stern, 1985). From here, the child, through language can 'regulate his behavior', 'begin social interaction', and 'pay attention'. All these questions are based on the dubious capacity of children to be 'hypothesis elaborators', defended by Bruner's proposal (1981), who in turn is based on the ideas of Chomsky (2002 - 1957), who proposes the existence in our brain of a 'language acquisition device'; a sort of innate 'linguistic processor' in which a 'universal grammar' is 'engraved', or what is the same, the knowledge of the rules existing in all languages. The child, according to this particular theory, upon

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receiving linguistic stimuli from its environment, derives the 'universal grammatical rules' to form new, perfectly structured sentences.

Regarding the emergence of symbol use, it is speculated that the child 'acquires' a repertoire of conventional sounds and gestures that express intentions, which presupposes a growing knowledge of shared meanings (Bates, 1979); ideas that also have a Chomskyan imprint.

Time has shown the inconsistencies of the theories invoked above, since none of their predictions have been proven. However, they are still used today to 'explain' how the child acquires language, and what is altered in these non-existent mechanisms, so that an autistic person presents a socio-communicative deficit. Some of these theories are more than 60 years old, and all of them adhere to the computational metaphor.

When an attempt was made to find a neural correlate of the mechanism of 'paying attention', a theory emerged that tried to establish a bridge between 'paying attention' and socio-cognitive development. This theory was called 'Theory of Mind'.

According to the original theory, with respect to social cognition, children develop a succession of 'theories of mind' that, as true scientific theories, postulate coherent abstract mental entities and laws that allow them to make predictions, interpretations, and explanations. This would enable them to interact successfully with other people (Leudar and Costall, 2009). For the autistic child or the child with Asperger's syndrome, cognitivist psychologists affirm, this is not possible, hence the difficulties these children have to communicate socially and their language disorders.

Theory of Mind (ToM) did not go beyond the promise of confirming the cognitivist philosophical claim that our understanding and common sense can be explained by an 'empirical theory' of mind (e.g., Premack and Woodruff, 1978; Leslie, 1987; Wellman, 1990). This assumption is also a direct heir of the theory of language elaborated by Chomsky, which was, at the same time, a cornerstone of cognitive psychology (Salatino, 2012).

This particular and uncompromising approach to the mental led to lucubrations that assigned 'mental states' to others and to oneself, coordinated with social actions. A sort of 'mind-reading' or 'mentalization' by which one can infer the internal states that give rise to the desires, emotions, beliefs, and intentions of others. The appellation 'theory' arose from the claim (without valid argument) that interpersonal understanding was a theoretical achievement, involving a person constructing and using a 'theory' or any surrogate logical mechanism about the nature of minds (Leudar and Costall, 2009).

ToM is one more of the dogmatic edges of the computational metaphor of the mind that was transformed into 'objective truth' by cognitive psychology, and from which we lack an adequate epistemic perspective to know what another person really thinks or feels, or to understand our own thinking and feeling.

Proponents of the theory argue that only experimental evidence can determine whether someone is really capable of understanding other people. Thus arises the first methodological difficulty in validating this theory, which is the fact that experimentation is fraught with artificial, biased, and strictly controlled conditions such that it becomes evident that the person being examined takes a certain

'psychological shortcut', generally of an inferential nature, that makes him understand what others feel or are thinking. Cognitivist psychologists take the data for their experiments from their 'theoretical inferences' that arise, they claim, from the available evidence, which always proves to be totally disconnected from the hidden mental structures they seek to uncover.

Transcurssive Logic (TL) has shown that inferences are not part of the arsenal used by the psyche to generate thoughts or ideas (Salatino, 2013), so we conclude that the cognitive sciences that support ToM are on the wrong track, because they fail to get to the essence of the phenomenon under study, the only way in which their proposal could make sense. In short, ToM is not an adequate way to analyze social understanding, because it is based only on apparent patterns of social behavior, which can never be confirmed in reality, because they arise from unobservable phenomena.

Beyond the absence of arguments that validate the ToM paradigm, its dogmatic nature becomes even more evident when this scientistic and self-sufficient proposal that sustains it becomes refractory to neurobiological evidence, beyond the scarce and flawed empirical evidence available.

2.0. SUPPOSED NEURAL BASES

More typical of an 'intellectual imposture' in the style of Alan Sokal and Jean Bricmont, than of a 'serendipity', the 'mirror neurons' emerged in 1996 in the hands of Vittorio Gallese and his team, at the Institute of Human Physiology of the University of Parma, Italy. Cognitive neurosciences assume that this is the undisputed neural basis of ToM.

Even the same defenders of the theory that 'we understand the action' because the representation of that action is activated in our brain, have pointed out a series of evidences that show that the data obtained in monkeys do not prove this theory of cognition based on 'mirror neurons', nor does it prove the dubious existence of these cells in humans dedicated to the 'understanding of action', a capacity that, although it does not have a homogeneous definition among researchers, has been assigned as an explanation even for the perception of speech, or as a necessary bridge between 'doing' and 'communicating' (Rizzolatti & Arbid, 1998). Arbid, 1998).

Another problem with 'mirror neurons' is that their existence and behavior have been inferred through a number of indirect means, which lack specificity (PET[2] , fMRI[3] , TMS[4] , MEP[5] , among others) (e.g., Baron-Cohen et al., 2013). Given the above, is that there is no firm evidence that in the monkey, 'mirror neurons' enable 'action understanding'. On the other hand, the relationship between monkey 'mirror neurons' and the human 'mirror system' is not parallel or better, it is indeterminate. In the human, the 'understanding of action' (if this exists) is dissociated from the neurophysiological aspects of the supposed 'mirror system'.

[2] Positron Emission Tomography.

[3] Functional Magnetic Resonance Imaging.

[4] Transcranial Stimulation.

[5] Motor Evoked Potentials.

There is a frank dissociation between the supposed 'understanding of action' and the production of action. Damage to the inferior frontal gyrus (the human brain area homologous to monkey F5, which is where 'mirror neurons' were first 'found') does not correlate with a deficit of 'action understanding'. Finally, the generalization of the 'mirror system' to speech recognition fails on empirical grounds. In short, as fascinating as the proposed existence and functioning of these cells is, it has never been properly tested in monkeys, and in humans there is strong empirical evidence of a double physiological and neuropsychological dissociation conspiring against it (Hickok, 2009, 2014).

The section on voice recognition and the onset of intentional communication in humans, managed by mirror neurons, deserves a special analysis, given the importance of the subject in autistic people who frequently present serious language disorders, which are attributed to a difficulty in the elaboration of the ToM.

The boldness of the proposal (Rizzolatti and Arbid, 1998) is such that a 'prelinguistic grammar' is assigned to the control and observation of action in the monkey brain. In order to provide an abstract expression of the 'meaning' of the neural activity of the premotor cortex (area F5 of the monkey), the researchers chose to adhere to Fillmore's (1968) 'case grammar' linguistic theory, a derivative of Chomsky's syntactic theory. This approach to language considers the existence of a surface and a deep structure of sentences. Or, an imperative structure (arbitrarily assigned to the canonical neurons of the F5 region), and, a declarative structure (assigned in the same way to the 'mirror neurons' of the F5 region of the monkey). Then, in an almost magical way, a transition from action to language occurs, applying to linguistic commands the same principle as to motor commands, making Broca's area 'encode verbal sentences', restricting 'nominal sentences'. This 'knowledge' (objects or noun phrases) could be completely outside area F5 (in monkey) or Broca's (in human); for example, in the temporal lobe.

Beyond the total lack of foundation shown by this strange way of suggesting the origin of our language, in a previous work (Salatino, 2012, p. 257) we demonstrated that none of the cognitive linguistic theories in force today, comply with demonstrating how our language is produced and understood, much less can they contribute anything about its origin, or of the supposed 'mental structures' that support it.

According to the analysis performed, the assertion "*there is evidence that the same neural structures that are activated during sensations and emotions are also activated when the same emotions and sensations are detected in others*" (Gallese, 2001), is unfounded, so *mirror neurons* have no proven relationship with the 'representation of action', nor with empathy or putting oneself in the place of the other.

3.0. EXPLANATION OF THE "NON-SOCIAL" FEATURES OF AUTISM

We will try to elucidate, from TL, the 'non-social' features of autistic behavior, which cannot be explained by the 'lack' of a ToM.

> *"Conventional language can only provide meaning, that is, a superficial and external appreciation of what the subject perceives and elaborates in his contact with the environment, but in no way is it acceptable to assign to an arbitrary conventional code, the task of supporting all the cognitive and social functioning, and much less, that it is able to put in evidence its intimate mechanisms."* (Salatino, 2018b, p. 398).

To fully understand the above statement, it is essential to specify how a standard psyche is structured and functionalized, in order to better interpret the psychic differences that autistic children possess, which are determinants of the sociocommunicative deficits shown by these children (Salatino, 2021).

Let us quickly review, on a less technical level, what we said in another work (Salatino, 2012, p. 340). There, the different evolutionary moments of psychic development were established in detail and a slight mention was made of the phenomenon of comprehension. Here we will see this phenomenon in more detail, but without ceasing to refer to the different instances that make it possible.

Let us pay attention to Figure 1. In it we can observe a series of events, which in some way represent the elements involved in the formation of the first logical-relational structure that will support the cognitive activity itself, i.e., the *species.*

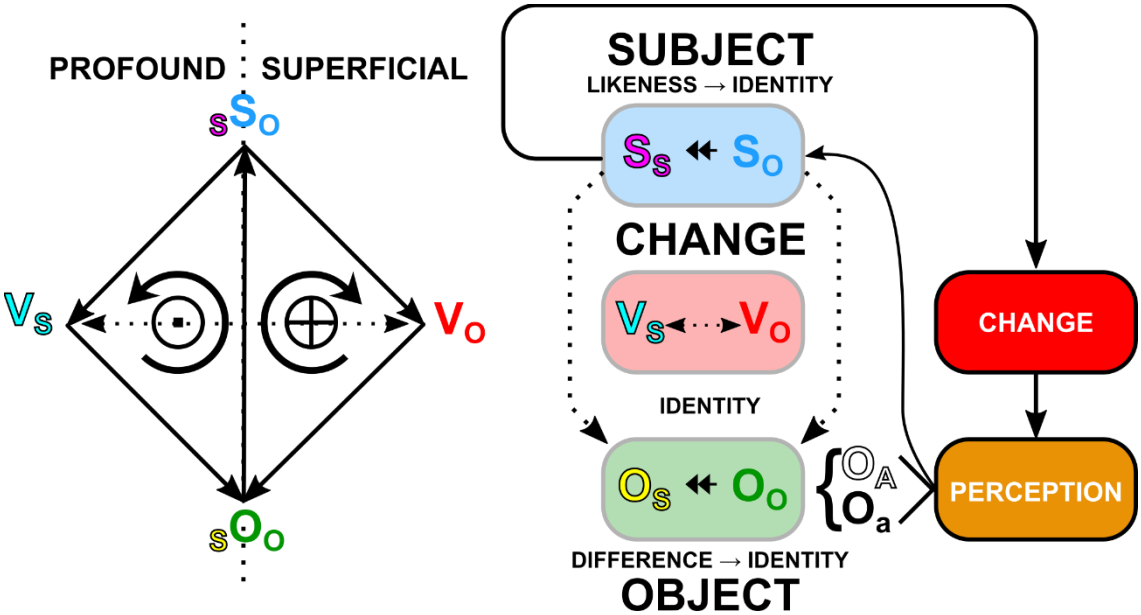


Fig. 1. FORMATION OF A SPECIES
References: O_a : Authentic object - O_A : Apparent object
O_O : Objective object - O_S : Subjective object - S_O : Objective subject S_S : Subjective subject - ⊕: XOR ⊙: XNOR

As we can see in the figure, everything begins with a *change*, which may be external or internal and which is what is perceived in the first instance (we are beginning to understand why the autistic has problems with language, since these children resist change). It does not matter for now, what the perceived thing is about, but that there is a compelling need that must be satisfied, and this is the only means available to achieve such satisfaction. Furthermore, as the figure also shows, the formation of a *species* goes through two main stages: a) The achievement of the *identity of the object*, and b) The achievement of the *identity of the subject*.

Stage a: the identity of the object is a process that is triggered after the perception of an authentic object (O_a) that is destined to palliate the vital need. Once the need is satisfied and after its reappearance together with the simultaneous absence of the Oa, an apparent object is generated (O_A) that not only attenuates but does not eliminate the dissatisfaction, but replacing the subject (object) in need, gives rise to the objective object (O_O), the perceived.

Once this situation has evolved and after tolerating the co-presence of the O_A and the O_a , a subjective object (O_S) is created, which certifies the differences between the O_O and the subject as object or objective subject (S_O). The first relationship between the S_O and the O_O is thus established, leaving proof of a change or transformation operated on the surface, in the evidence, in the appearance: the objective change (V_O) and the conformation of the *identity of the object*, with its two aspects: O_O (the superficial) and O_S (the deep). The main mechanism that allows achieving this identity is the 'toleration of differences' (the autistic does not tolerate them).

Stage b: The differences accepted in the previous stage do not resolve the absence of a source of satisfaction for their need and this is because the supposed change inflicted by the S_O does not seem to be such, so some other element must be sought, preferably non-organized, that is capable of transforming the O_S . The latter is finally achieved by abandoning (negating) the organizational process used so far and generating a subjective subject (S_S) by tolerating those different sensations can be perceived by different subjects belonging to the same category.

Thus, on the one hand, the *identity of the subject* with its two aspects is formed: S_O (the superficial) and S_S (the deep) and on the other, a second relation or change in depth is established: the subjective change (V_S), this time between the S_S and the O_S , thus completing a *third identity*. This identity corresponds to *change*, which now has two strands: V_O (the apparent or superficial) and V_S (the hidden or deep).

The main mechanism for the achievement of the *identity of the subject* is the tolerance of the similarities between the two types of subjects, which remain contained and 'differentiated' in a category. This stage is forbidden to the autistic, so that the lack of identity of the subject (which remains tacit) and of change (which is not perceived) leave his psychic conformation 'incomplete'.

Now we have the four elements that constitute a *species*, namely: subject (S), object (O), the objective differences that unite them (V_O) and the subjective similarities that separate them or *category*, which is globally represented by V_S . The diagram on the left of Figure 1 shows this structure of the *species* and the dynamics described.

This process, as the figure indicates, is cyclical; it is repeated after some time and predisposes to achieve complete satisfaction, something that will occur when the "true understanding" of a given fact arises, or what is the same, when the tension accumulated through multiple dissatisfactions is discharged through a concrete response that certifies the full interpretation of the situation presented, that is, when, using thought, meaning is found in something. Therefore, the autistic does not make sense of anything that has to do with the socio-communicative.

A *species* is like music, since it forms the appropriate substrate to be able to express circumstances, feelings, ideas or thoughts, although unlike music, it is not a stimulus that affects perception, but a perceptual achievement that has elements equivalent to musical ones (Salatino, 2018b, p. 249). For such reason, music therapy remains a useful therapeutic tool in the case of children with ASD.

There are a number of peculiarities of central nervous system (CNS) functioning, known as 'functional geometry', which include neurogenesis and plasticity, neuronal circuitry, the CNS as an autonomously controlled and regulated system, electrical coupling between neurons, bi-rhythmicity of some neurons as simultaneity detectors, neuromodulation, and switching or bistability of an entire network influencing a neuron, the bi-rhythmicity of some neurons that function as simultaneity detectors, neuromodulation, and the switching or bistability of an entire network influencing a neuron, which justify an initial conformation of the human psyche, such as the one we have described (Salatino, 2018a).

The other aspect that we must point out, if we want to understand what we mean when we talk about 'social skills', is to define what is a real fact from a social point of view.

3.1. LOGIC OF A REAL EVENT FROM THE SOCIAL POINT OF VIEW

There are a series of relationships that link the fundamental elements that determine an elementary social act (Figure 2).

The following figure confirms, on the one hand, the interrelations established between desire and belief in a social individual, that is to say, the imposed or voluntary character of each of them and the emergence from there of the different beliefs (Tarde, 1895, p. 12). The codes assigned in the graph are due to having considered desire as the patrimony of the subject and belief as an object of that desire. But, on the other hand, this scheme corroborates, without a doubt, that the logical core of every social act as we see it here is a PAU (universal autonomous pattern), according to the definition given by Transcurssive Logic (TL) (Salatino, 2017).

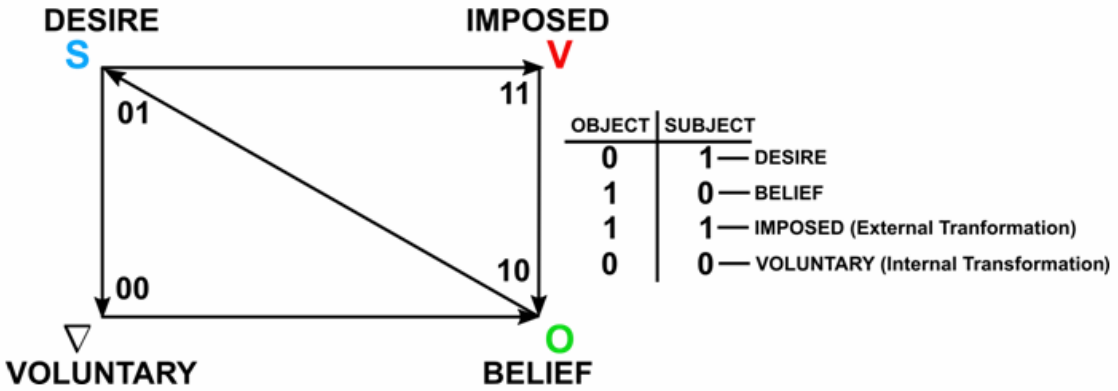


Fig. 2 PAU OF AN ELEMENTARY SOCIAL ACT

On the other hand, the needs that give rise to the social act are satisfied through the 'social patterns' that are evidenced, individually, in the behavior of the subject

or individual and at the social level, in the conduct of a person, through a series of 'social figures'.

These "social figures" fulfill the non-trivial function of establishing the 'social role' that is made evident by a given behavior. That is, by that behavior that is limited by a norm (Salatino, 2009) (Figure 3).

The two social aspects considered are vital in establishing how we acquire our natural language.

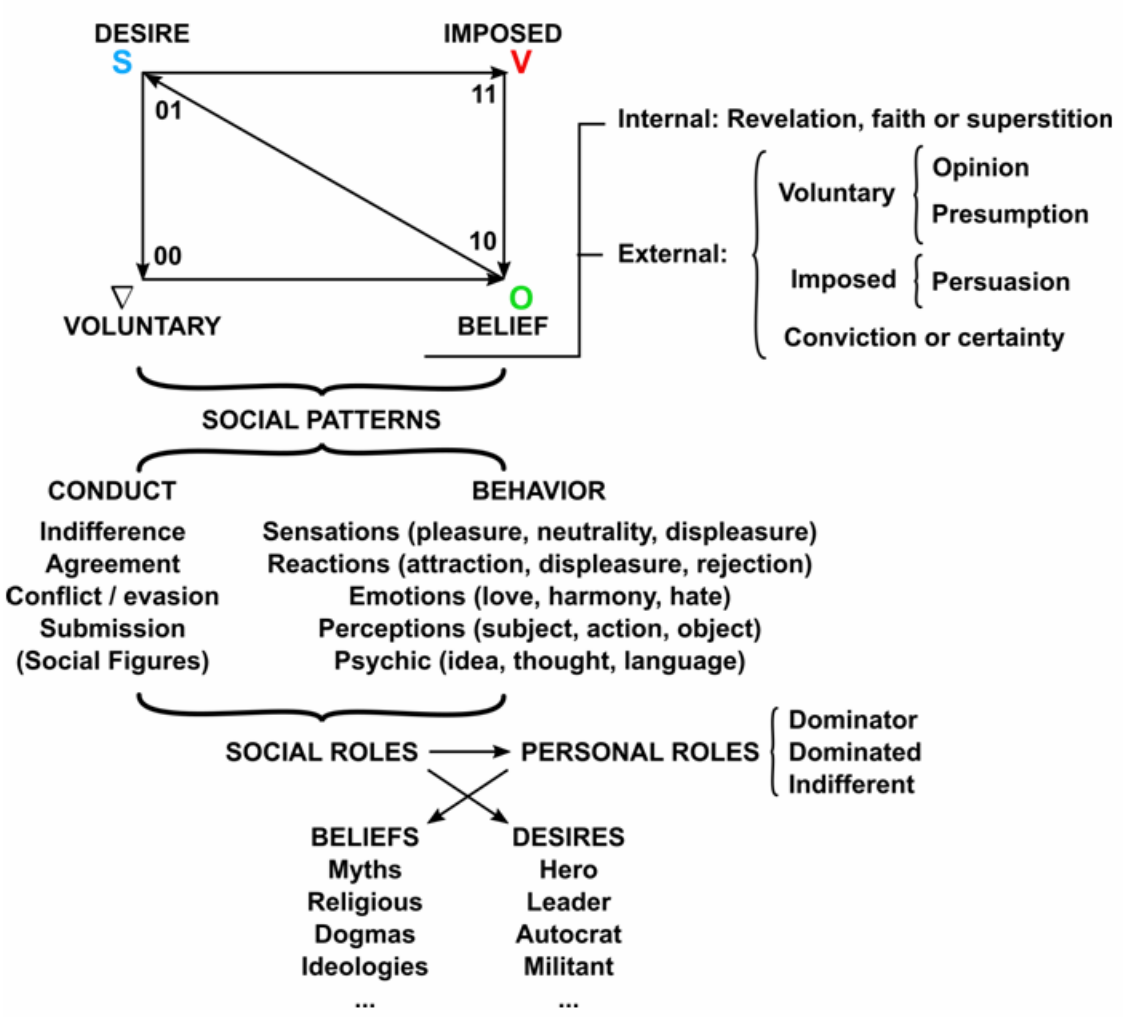


Fig. 3. LOGIC OF SOCIAL RELATIONSHIPS

4.0. ON SUBJECTIVE REALITY

Transcurssive Logic (TL) shows us a reality that is not a wasteland devoid of life, but on the contrary, it is what contains everything that is possible thanks to life, but that cannot be shown directly, but only through its unmistakable manifestations. The subjective reality is everything that cannot be seen, but can be perceived and felt, and to which every living being has to respond in the hard work of inscribing, in 'flesh and blood', its history. That which affects us directly and manifests itself indirectly through its presence. From the subjective reality it

makes no sense to distinguish between reality and fiction, because the assembly of all possible worlds is the only possible world outside the monocontexture.

The vision that our subjective reality gives us of everyday reality is pure fiction; it is like the sound of the bell that the blind person uses to 'see' the time on the clock in the church steeple. The subjective reality is transparent, it casts no shadow, it leaves no trace on the path, although it does leave a trace on the subject who holds it. TL makes it possible to investigate these traces and to project them in the evident conduct and behavior, without feeling the influence of schemes and formalities that respond to a determined law in force in the monocontextural content.

In subjective reality, what makes sense and what does not make sense is not irrevocably determined by a sociocultural convention, but by that which 'becoming flesh' can be related to the only environment in which it is possible to survive. To project the subjective is not to make the fantastic, the hallucinatory, the transitory alienation of dalliance perfectly quotidian and natural, nor to make a sense of unreality a law. It is to show the evolutionary history that allowed every living being, according to its complexity, to go through the cumulative stages of subject, individual and person, as the case may be. That is the task of TL.

The subjective reality, seen from the monocontexture (from our universe) presents characteristics that make it opaque to our ignorance, because as we have already said, it does not show itself directly, but suggests itself. Its internal timelessness as a dreamlike warp, the lack of a net limit between life and death, the split identity, the subject/object coexistence are some of the factors that link it to the existence of every living being.

It is as if this strange world, in spite of being so unique, were the product of a furious attack that forced the subject to express himself in a language apparently incomprehensible and unknown, at least to the 'sane' who inhabit the monocontexture. It is a manifestation that, being contrary to the rules and norms that force us to a limitless conception of our limited world, empowers us to have a perception, neither better nor worse, but different from reality.

Subjective reality is that ineffable realm where true (meaningful) and 'incarnated' knowledge can be attained without any empirical verification, nor any logical or rational support to ensure strict compliance with the so-called 'laws of nature', which, seen from the perspective of polycontexture, seem to be mere *obiter dicta*[6] .

Not always, when what is perceived does not coincide with the evidence shown, we are facing a state of insanity. We could say, without fear of being too wrong, that when this happens it is because some unusual contact has occurred between the apparent objective reality and the inescapable subjectivity.

Subjective reality is not related to the religious, poetic and metaphysical worldviews proposed by Dilthey (1949) in his 'Sciences of the Spirit', nor to paradigms that are undergoing an update in an attempt to overcome the obsolescence of old schemes. It has to do with truths or beliefs, needs or desires that make us 'see', individually, a universe in which our life, our knowledge and our natural language are settled.

[6] Incidentally, they never end up being laws (Author's note).

This reality, which involves a vital, psychic, and social activity, is not related to the objectivity that science tries to impose, nor to the logic that sustains it or the philosophy that justifies it. Therefore, it is not conditioned by the degree of social development, nor by the scientific status, nor the level of education. Ideologies, religions, science or political doctrines influence one's conception of reality strictly according to the beliefs or social truths that are a direct consequence of the imperative need to be considered.

Every living being has the capacity to form an internal structure that allows it to adapt in order to stay alive. In a way, it could be said, that each subject generates a model of the environment in which it learns to maintain its life, to 'dialogue' with its environment and to relate to its fellows. It is not a 'static internal image' that with one-to-one correspondence and tied to a specific time, gives us the basic information of a supposed 'absolute truth', as modern theories would have us believe, when considering space as the 'container' of such reality. In this internal structure that we are proposing lies the possibility of generating a subjective reality that, according to the complexity of the living being in question, can be constructed through its biology, or biology plus the activity of its nervous system, or both, plus its sociocultural activity.

According to the above, the last of the subjects that represents man, holds an adaptive-evolutionary accumulation of elements that allow him to face his reality. This does not mean that, in addition, the human being has the possibility of making a better evaluation of that reality, according to a series of social and therefore apparent 'attachments', which supposedly place him at the top of the evolutionary chain. In other words, even if we obtain a different answer to the question "What is reality?", asked to people with different levels of education, it does not mean that they "understand" that reality according to the common sense that allows an empirical explanation. Nor does it mean that they understand it from a critical point of view that supports a scientific explanation, much less from supposed first causes within a natural order that justifies, without doing so, a fundamental and systematic reflection.

Each living being has the reality it needs. For this reason, any definitional pretension is meaningless, with the exception of man who, being immersed in a system that he tries to define, being part of that definition, is incapable of sustaining an 'objectivity' that reaches the immeasurable limits assigned to him. The simple fact of having to comply with a mere convention does not allow him to see the reality that hides behind the appearance.

Each living being has the reality that its evolutionary level allows it to recognize; therefore, it is dependent on its bio-external system[7] , and within it, on the nervous system or its equivalent. In the case of man, it has nothing to do with the naive conception that Kant had in this sense and that in one way or another, has been and is the one that science, especially modern research, sustains. This does not mean that each species 'sees' the universe that surrounds it in a different way, according to its biological differences, but that, in accordance with its level of complexity, as we have already said, it constructs this reality according to its needs, but guided by a single language; a *universal language* that associates it with everything that has or serves to generate life.

[7] The actual system that encompasses your body and objects external to it.

- The patterns of the living

According to our approach, something can be considered alive if:

a. The origin, order and function of the basic elements that enable life are inseparable and universal.

b. If instead of showing us a 'snapshot' of his present he reflects his history and his clear intention to survive.

c. If it does not exhibit a precise boundary between it and that which is lifeless.

d. If in its conformation elementary units intervene that are evolutionary, that make the 'living' rather than 'units of life'.

e. If its primordial forms are simpler (or less complex) than the final forms, although both start from the same basic structure.

f. If it has at its 'base' the same elementary 'logical structure of relationships' as everything living. If it is governed by the same universal language that governs everything else.

g. If its condition of living arises from the distinction between a superficial level (apparent) and a deep level (hidden). And by how the deep level is projected onto the superficial one, giving rise to a change or transformation between the quantitative and the qualitative, generating a cycle that begins again indefinitely.

h. Whether the emergent (apparent) properties are discrete, while those controlling the deep transitions are continuous.

Therefore, the major criteria necessary to understand the living, as presented here, are order, disorder, change, frontier, cyclical behavior and its dimensions: structural (1D), dynamic (2D), functional (3D) and transcendent (4D). These guidelines could be narrowed down even further if we were to say that the enigma of life is restricted to solving a single problem: to find meaning in reality with the sole intention of surviving.

The process of giving meaning to the real, which we will know here as 'semiosis' or 'semic act', is not restricted to a Biosemiotics or semiotics of life. Rather, it is considered as a true living process where 'contrary aspects' merge into a complex unity that, in total agreement with all that is real, becomes the sign of a mediation between contextures.

This cyclical process is the hidden engine that promotes in the living being the leaps in time, through the thin unidirectional line of the eternal present that separates its past from its past future[8] .

[8] "What was, will be." One has an answer before the future becomes present. This future is not a 'futurable', that is, it is not a possible future conditioned in cause and effect, but only in cause, by something that happened previously. We could somehow liken it to a 'futurible', as it is similar to the desirable future of Bertrand de Jouvenel (1967, p. 18) and I say similar because here, unlike what is proposed by this French author, the desire does not necessarily originate in a questioning of the present situation, whose origin is in what was learned in the past, but because it originated and was satisfied in the past, it determines the future. "*If something were not what it was, it is surely not what it appears to be*." This is not making 'prospective' or imagining a future, it is predicting the future to give fulfillment to a single desire: to stay alive. It is not to be confused with the anterior future verb tense which describes an action that is to take place in the future, but which was already fully defined in the past, that is, it indicates an anteriority of the action. In the

Semiosis' is considered as the fruit of an evolution that never ends and that has brought life and its expressions to what we know today. In this evolution the living has acquired a 'universal language' (UL) that structures reality as a whole.

It is probable that the environment was structured first, and then followed by life forms that, in order to differentiate themselves beforehand and maintain that difference afterwards, had to assimilate the logical (relational) structure of what surrounded them. Configuring themselves, logically, in a homologous way, they learned and were able to evolve, that is, they survived.

Subsequently and as a consequence of the development of an internal control system, the central nervous system (CNS), the possibility would have arisen to structure on the basis of the same UL, embodying them, the management of certain processes that, being repetitive, became automated and served for a better adaptation to the demands and a greater aptitude to maintain their condition of life.

The exponential growth in the complexity of the different developed systems promoted a greater consumption of resources. The early depletion of these resources made it necessary to replenish them, and the mode of replenishment split the biological world into two large subsystems. On the one hand, that of plants and simple beings that either generate their own resources from the environment or have them at hand. On the other hand, that of animals whose CNS allows them to search for the sustenance they were unable to produce, forcing them to travel far and wide.

The dangers that threaten life on the long road towards the attainment of sustenance force the structuring of an alert mechanism to protect oneself from such threats. The *protopsyche* arises, which also allows to better control the automatic mechanisms arising from the experience[9] .

The appearance of other individual organisms made imperative the emergence of some means of communication between them, to ensure two important aspects: firstly, to survive, through the reinforcement of individual tasks with group tasks in order to prolong life and secondly, to perpetuate the species. The above suggests that, outside of the UB, which as a base supports the structure of all reality, another language appeared that was used as a means of communication between peers, but not with the aim of transmitting information to each other, but as a way of achieving different levels of reorganization of the surrounding reality. All with the sole purpose of a greater and more adequate adaptation, this language is the natural language (NL).

Figure 4 summarizes the semiosis process described above.

future past tense, nothing is said of the action itself, only of the uber past, besides, it is not a verb tense. It is a vital tense! (Author's note).

[9] "Psychic processes were born [...] under selective pressure, they have a life- and species-preserving value [...]" (Lorenz & Leyhausen, 1979, p. 6).

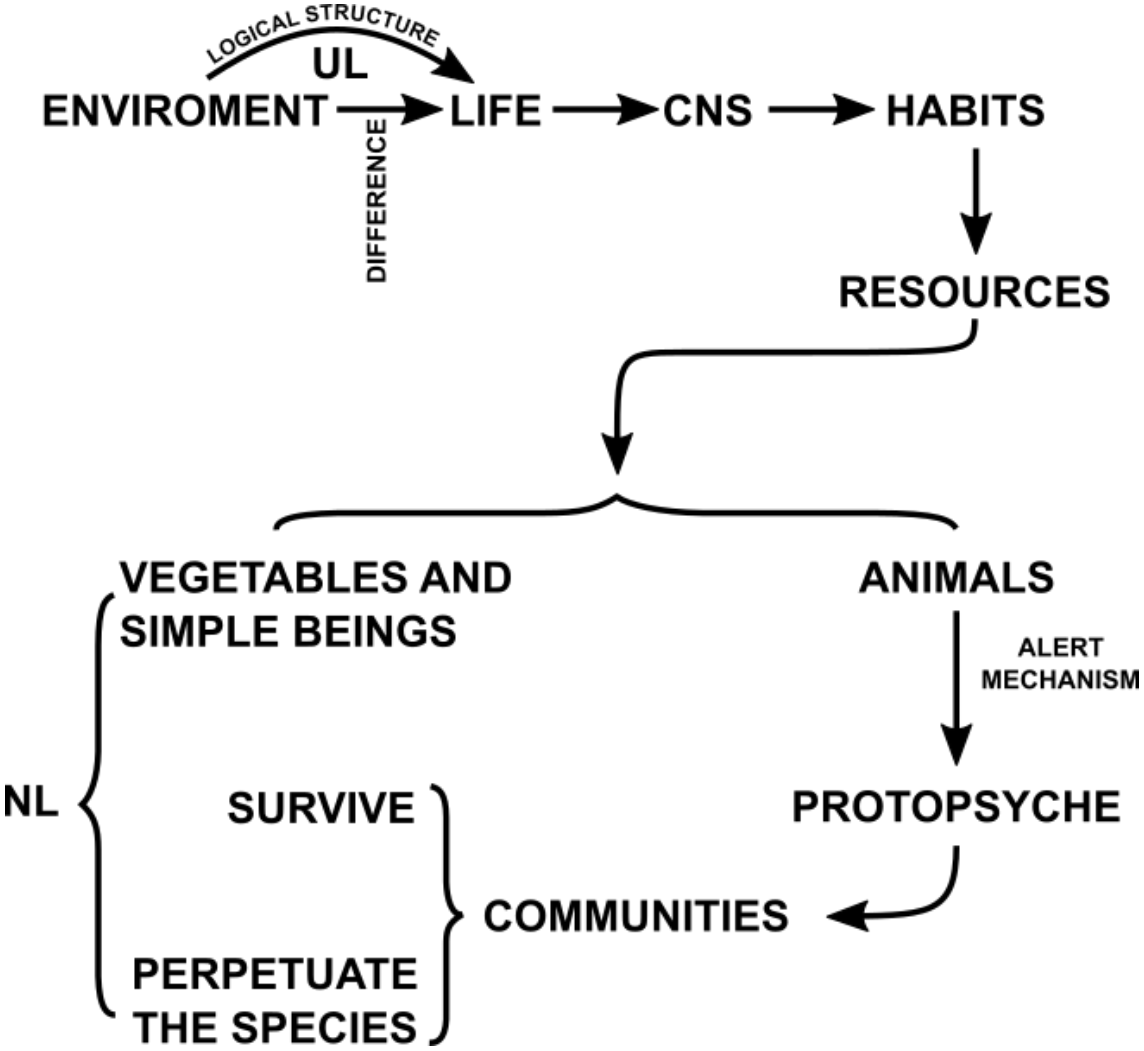


Fig. 4. SEMIOSIS AS EVOLUTION OF UNIVERSAL LANGUAGE
References: LU: universal language - LN: natural language

5.0. PSYCHOBIOLOGICAL BASES OF COMPREHENSION IN HUMAN NATURAL LANGUAGE.

Natural human language constitutes the communicative medium that operates by reorganizing the surrounding reality and its nature is symbolic. The symbol, as seen by transcurssive logic, represents a kind of identity, but a split identity. In other words, just as it happens with the real actors, subject and object, the symbol has two aspects: a superficial one, which is the one that is evident in the meaning of everyday language and can only be interpreted, since it has no relation with the psyche; and a deep one, which is 'nested' in the psychic function, that is, in thought, which can be understood.

The dynamics of natural language is sustained, according to the proposal presented here, in a psychic origin of the deep aspect of the symbol that derives from an idea. The psychic structure gives rise to the 'historical record' of the subject (or structural memory) but also serves as a 'mold' (that is why we call it psychic DNA) to generate thoughts. These, from the logical transcurssive point of view, are the 'negation' of ideas; the only way to achieve an approximation to

the depths of subjective reality (Salatino, 2009). The thought thus constituted represents the 'germ' of the symbol and a new negation will transform it into a superficial manifestation that will be nothing more than a particular 'reflection' of a thought and a filtered 'image' of the reality previously perceived, but without any relation to it.

Using the metaphor of colors, perhaps we can better understand the proposal.

We said in another work (Salatino, 2018) that a given color represents in this particular reality, a real fact. When this real fact is perceived by a subject, what is brought by the evidence, is registered in the structural memory and becomes part of the psychic structure, by means of an idea. A negation of the registered color, which means obtaining the complementary color, becomes the psychic function which, by taking the previous idea as an argument, is transformed into thought. This complementary color has a certain 'saturation', that is, it is more or less 'illuminated'. This illumination is nothing else, here, than the 'level of consciousness' with which it is being considered. Subjectivity adds a certain 'degree of transparency' to the color obtained. The deep aspect of a symbol, or what is the same, an understood sign, is thus formed.

When the time comes to 'communicate' the lived experience, on the formed thought (the complementary color), a new negation is produced, with which the perceived primary color is obtained again, the superficial aspect of the symbol. In reality, the product obtained and that will finally be communicated is not at all the same as the perceived one, since the psychic filter added 'luminosity' and 'transparency', two characteristics that modify it but that cannot be transmitted by means of a simple verbal expression, hence the lack of relationship between both symbolic aspects.

The resulting color, which will be assumed by an interlocutor in an expression, is 'of the tone' of the one previously perceived. That is to say, it is quite similar but does not have all the characteristics perfectly preserved, so that the 'experience told' by the subject only produces an approximate idea in his interlocutor, which although it does not generate psychic structure as when he perceives a fact, it is enough to be able to understand it, by achieving an agreed psychic reconstruction, very approximate thanks to the linguistic code, of the experience lived by the one who tells it to him.

It is very important to differentiate between understanding and comprehending. To understand is to perceive the meaning of something, even if it is not understood. My interlocutor can understand what I say when I tell him about the 'color perceived' by me, but he does not understand me. In other words, he finds the meaning of what happened, but not the sense. For this reason it is very common for someone who hears our account of an event represented by a 'color' to say: "*I understand you, but...*". If he had understood, the "*but*" would not exist. The approach we have made of an extremely fictitious situation could leave the sensation that this is not what usually happens, however, there is only a full understanding of something when that something is lived by ourselves. That is to say, it is part of our 'embodied experience' and is not only a 'holographic image' of that reality, like the one that is generated when we are told something using conventional language, and we have never gone through that situation.

The real fact for the listener of the story, the 'perceived color', will be that of the linguistic expression that will be 'tinged', although with nuances, with the same

conventional tone of the 'color' that his interlocutor had perceived. Dialogue is made possible by the fact that both speakers have in their psychic structure an organization achieved by experience and which is in accordance with the facts that occur in reality. Therefore, the structure of what is expressed keeps a conventional and normative relation (imposed by culture) with what happened. But the psychic foundations of understanding are not visible on the surface for the one who perceives the expression and not the fact, but it remains anchored in the psyche of the speaker as the logical foundation of the subjective, and this is because the real fact that is associated with the surface code is understood. Thus, my interlocutor understands me, but does not comprise me. If there were the possibility that he had gone through the experience of perceiving a fact of similar characteristics (although they would never be the same), it is also possible that there is an interpretation based on *logical categories*, as well as understanding, but that in no way equates to my understanding which is based on *species*. Understanding, like subjectivity itself, is an absolutely individual and non-transferable aspect, therefore, the same thing will happen to me when my interlocutor relates to me something experienced by him.

By way of summary, we propose Figure 5, which tries to consider what would occur during communication in a semantic act (semiosis), understood as the expression of a real fact and where the psychic mechanisms (properly subjective) of: perception, comprehension/understanding (interpretation) and production of a linguistic expression are made explicit, in addition to the operative units of the different real systems that manage the other "linguistic" level of reality: universal language.

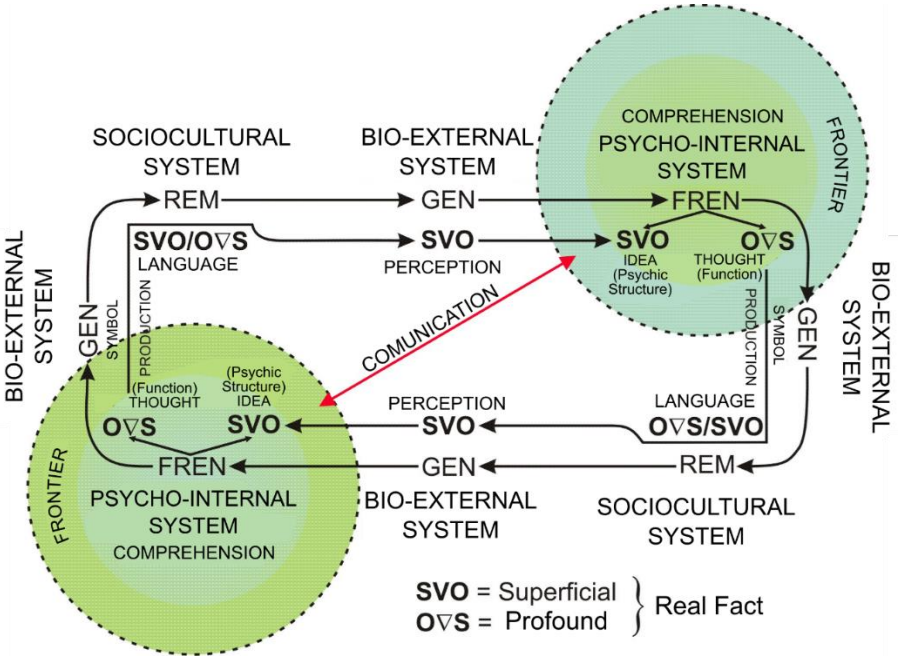


Fig. 5. COMMUNICATIVE PROCESS DURING A SEEMIC ACT

References: GEN: operative unit of the bio-external system - FREN: operative unit of the psycho-internal system - REM: operative unit of the sociocultural system (the three operative units respond to the logical unit of the universal language or PAU) - SVO: superficial aspect of the perceived reality (the seeming), psychic structure (the idea), external aspect of the symbol (the conventional) - O∇S: deep aspect of the perceived reality (the being), psychic function (the thought) and generator of the internal aspect of the symbol - FRONTIER: or psychic filter.

The figure shows the communicative process with its main actors acting alternatively as producer and receiver, respectively. Something that tries to reflect the bicolor tonality of the circles: external blue functions as subject (source of the change = producer), external green functions as object (destination of the change = receiver). Each maintains its opposite 'core' in depth becoming evident, in oscillatory form, (by turns) during the mechanics of the whole opening/closing process that occurs at the border, sealing the objective with indelible subjectivity. In the speaker there is the following succession of processes: learn ⇒ know ⇒ understand, while in the listener: learn ⇒ know ⇒ understand(interpret). Paraphrasing Wittgenstein in a way, we could express the above in the following aphorism: *"One can understand and interpret what is said and heard, but one only comes to understand what one is silent about"*.

All this dynamic is ensured, as shown in the scheme, by the persistent maintenance of the fundamental logical nucleus that represents the universal language, on which all subjective reality is structured and functions, as we have already seen repeatedly.

In an attempt to approach what has been considered so far from a practical point of view, we will approach the subject of irony as a sample of the different facets involved in the comprehension process of our natural language, and so that, when we approach the psychic disorders that afflict those who suffer from ASD, we can fully assimilate why these children do not understand the double meaning nor can they put themselves in the place of the other, being slaves of literalism.

6.0. IRONY AS A MODEL OF COMPREHENSION

Irony represents, for the most part, an eminently pragmatic element. Proof of this is given by the cultural background that must be available to interpret an ironic expression. What is said ironically in a given culture and language may not be ironic in other circumstances, although irony is always present. Nevertheless, the figure of irony is taken because beyond the language itself, its discursive figure has very well demarcated the mechanisms of production and above all those of comprehension.

Irony is one of those 'rare structures' of our language that shows us, without veiling, the reality as it is, since underneath its superficial aspect (evident) manifested in the literal meaning, its essence, the deep: the meaning, emerges. There is no other symbolic structure that has this property, that is, that of bringing 'thought' to 'the surface'. It is for this reason that irony constitutes an ideal material to investigate the cognitive mechanisms of our psyche and among them, those dedicated to the understanding of our natural language.

Irony derives from the Greek term *εἰρωνεία* (eironeia) meaning "*simulation*". The simulator (*eiron*) pretends to ignore that which he knows, thus veiling his true intention. The psychic structure that would allow the production of an ironic assertion should obviously be empowered to enable its comprehension if it is traversed, so to speak, simultaneously in reverse, otherwise it would be inadmissible, provided it is not affected by some pathology, that the one who utters an irony does not understand what he is saying. On the other hand, it is necessary to consider a not minor detail, a speaker is not only a speaker, but

alternatively becomes a listener and vice versa, so that a mechanism of 'back and forth' must be assured and must be fulfilled simultaneously. Bearing in mind the above, we will try to analyze in a simple way the supposed psychobiological bases of its comprehension.

In a discursive situation where irony is frequently used, the hidden intention is made manifest by the context, the intonation, the body language that tries to imply something different from what is being said verbally, hence the importance of culture. Whatever the way in which it is made evident, irony is a form that bursts into human communication from the very emergence of language.

From its place as a trope in ancient rhetoric to its persuasive use in today's political discourse, irony is an unconditional companion of our natural language.

A linguistic aspect that has been approached from so many points of view has to call our attention. We have been trying to define it for more than 2000 years and even today, there is no definitive answer, so I do not think there is too much error if we consider irony as a universal that, beyond the nuances that make it different, has a fundamental core of complex nature and absolute constancy.

Transcurssive logic can define that nucleus to which we referred, and it can do so since irony has as its logical basis a PAU (universal autonomous pattern). In such a way that, if it is possible to demonstrate the above, we could generalize the concept and say, based on the proposal presented in this work, that all subjective reality is ironic.

Given the current importance of the pragmalinguistic approach to ironic discourse, we will take one of the many theories on irony that have been developed in this specialty to contrast it with the transcurssive logical approach.

The theory of relevance proposed by Sperber and Wilson in 1986 has been chosen basically because, beyond being a theory with an important validity, it tries to contribute to the understanding of the cognitive processes that are supposed to provide elements that would allow determining what is implied through what is said. Moreover, it is widely used to support some aspects of ToM. The authors try to bridge the gap that, in the daily use of our language, occurs between what is said textually and what is really meant to be communicated, and they do so by applying different inferential mechanisms.

Before addressing what, the proposed theory tells us about irony, let us place it in the scientific context. Adept without discretion to Fodor's modular theory of mind, "*Following Fodor (1983), we view the mind as a variety of specialized systems, each with its own method of representation and computation*." (Sperber and Wilson, 1995, p. 71) constitutes an important bastion of cognitive psychology. A branch of psychology, let us remember, that assumes that the mind functions in a manner analogous to a computer, although arguing a non-mechanism by supposing that man built machines in the image and likeness of his innate mental structures, according to some of its advocates (Gil, 2006, p. 413).

Such a directed approach is necessarily anchored to a narrow logical perspective, which is none other than that of classical logic. Sperber and Wilson speak to us from their theory of inferences as the only genuine representatives of cognitive or mental processes, that is, of thought.

To accept without ambiguity the logical principles that govern Aristotelian logic as laws of thought is at least an inconvenient description (Stebbing, 1965, p. 529) since it suggests a direct reference to the uniformities of thought and to psychological aspects. For it to be pertinent to speak of thought when we invoke the traditional logical point of view, we can only be speaking of *logical thought* whose only purpose is to reach conclusions through reasoning; reasoning that arises when we start from something we "know" to arrive at something that, before such reasoning, was unknown to us. To know something, in this perspective, derives from a belief. For a proposition to be known we must believe it to be true. The crucial problem that arises is that no distinction is made between belief and knowledge.

There are at least five ways to arrive at a belief (Ibidem, p. 526):

a. That we have always believed in something, which we do not question and before which we are defenseless in the face of error.

b. Based on authority, which recognizes two variants: i) acceptance of a truth out of respect, and ii) acceptance of a truth because it comes from an expert.

c. In the face of direct (apparent) evidence.

d. By persuasion, which is almost always contingent on deception.

e. By conviction or reasoning. This mechanism is the patrimony of logic and, therefore, of science.

If we talk about *logical thinking*, we must say that one of its fundamental characteristics is *relevance*, that which allows establishing connections, but at the same time, does not exempt from the judgment that must be imposed to detect logical inconsistencies.

Sperber and Wilson extrapolate the aforementioned *relevance* to *relevance* as a universal cognitive pattern.

Specifically, the *theory of relevance* is based on *logical thinking*, that is, thinking based on principles that cannot be proven without presupposing them. In other words, it provides evidence concerning something unproven.

Logical principles can only be proved by themselves (circular argument) and therefore give rise to the self-consequence that transforms them into fundamental laws that cannot be transgressed. This is the same as saying, as we have already seen, that one is anchored in a monocontexture.

The strong adherence of the authors considered to the Fodorians precepts obliges them to propose a mental architecture that in no way differs from that of a *compiler* (Fodor, 1983, p. 41). These programs are modular, just like the mind that Fodor designed, inspired by Gall's phrenology (Domenech, 1977, p. 12).

By taking computational theory as a support, the *theory of relevance*, in its basic features, can be treated by Boolean algebra (1854), that is, by an algebraic formalization of the following logical operations: *and* (conjunction), *or* (disjunction), and *not* (negation), or their equivalents in class logic (Colacilli de Muro, 1979, p. 192): intersection, union and complement.

We will make an analysis of irony as viewed by *relevance theory*, which claims that "*the universal cognitive tendency to maximize relevance makes it possible, at least to some degree, to predict and manipulate the mental states of others*"

(Sperber, Wilson, 2004, p. 244). From this statement derives the use of *relevance theory* as one of the justifications for the existence of ToM.

Figure 6 shows an analysis of a supposed ironic production analyzed from Boolean algebra, through a neutral example of an ironic production based on the Aristotelian category substance, which is ontologically characterized by the pair of opposite concepts: substance/attributes (Aristotle, 2004, p. 31), adhering absolutely to classical logic.

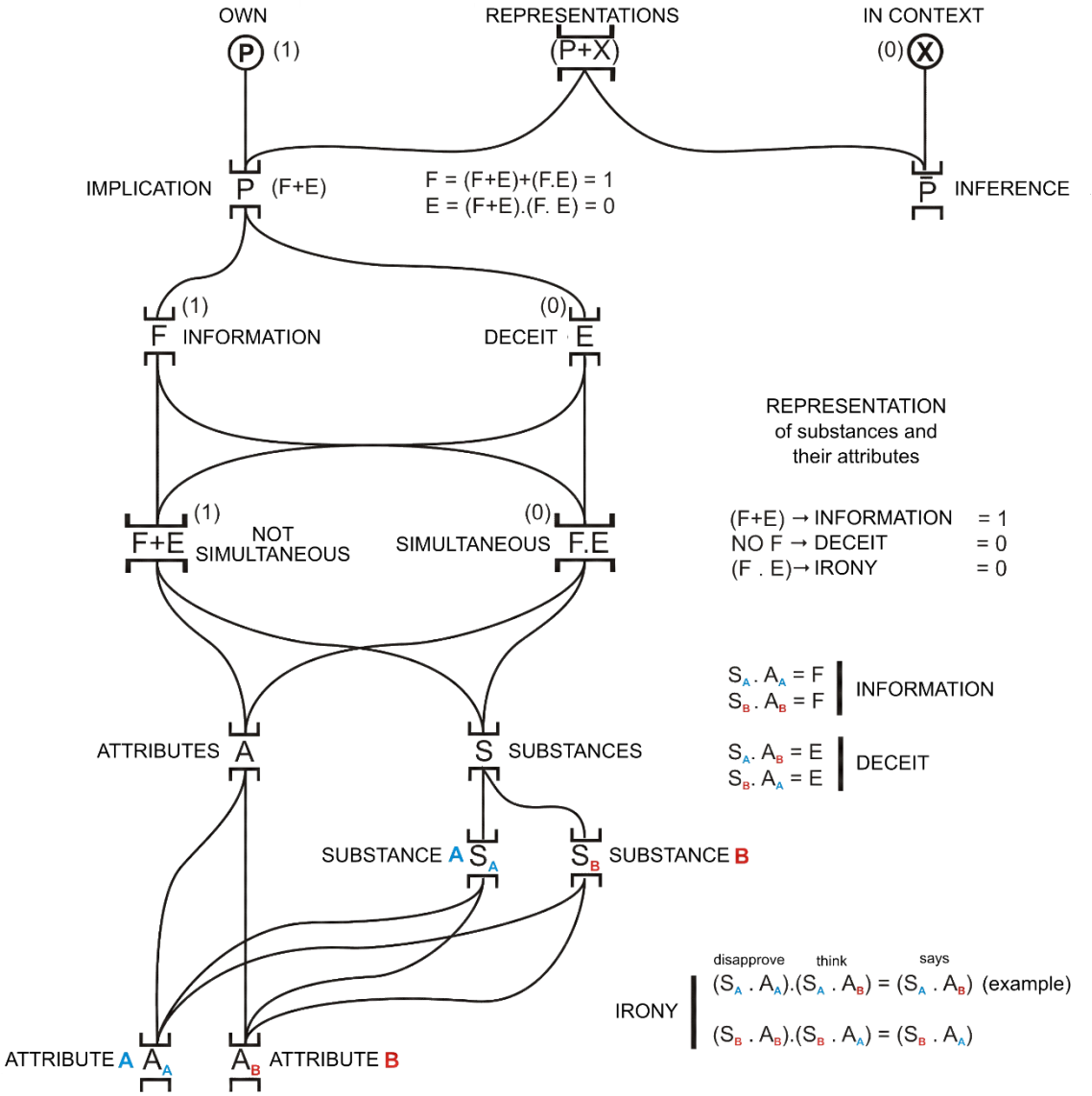


Fig. 6 A CASE OF IRONIC PRODUCTION
(Explanation in the text)

As shown in the diagram, this is how the mind of someone who is going to produce an ironic expression that is capable of influencing another person is supposed to work, in such a way that it can generate, inferentially, the inverse process and thus "guess" the intention of the speaker, that is to say, discover the irony.

It is based on the speaker's own representations from which he can draw his logical conclusions. The inferential branch or given in context is reserved for the

listener. It is assumed that irony is composed of what is said (information = F) and what is not said but is intended to be communicated (deception = E).

If we were to represent the relationship between substances and attributes to characterize information (F), deception (E) and irony, from logic, we can proceed as follows:

It is assumed that information (F) is being provided if there is congruence between the substance and the respective attribute (congruence evidenced by the subscript), thus:

S_A . A_A = F or S_B . A_B = F [1] (the (.) stands for conjunction or logical product)

We also assume that we are facing a deception (E) when there is incongruence between substance and attribute, that is to say:

S_A . A_B = E or S_B . A_A = E [2]

And finally, we will have an ironic situation, when instead of providing information (F), which is disapproved (Sperber and Wilson, 1992, p. 60; Gil, 2006, p. 414), a deception (E) is thought and communicated. That is:

(S_A . A_A) . (S_A . A_B) = (S_A . A_B) [3]

In [3] the expressions on the left in the equation represent what is disapproved and what is thought respectively, simultaneously; while the result of the operation represents what you end up saying. An identical situation occurs if:

(S_B . A_B) . (S_B .A_A) = (S_B . A_A) [4]

Applying the basic concepts and operations of Boolean algebra we determine what truth value we will assign to F and E respectively. Without going into details we see in the scheme that F corresponds to true (1) and E to false (0).

When we try to characterize irony, the following happens:

Information (F) is characterized by the presence of either F or E, but not both at the same time, therefore:

F(1) + E(0) = 1 [5]

Deception (E) is characterized by being the opposite of F. It is therefore equal to its negation:

E = noF = 0 [6]

Irony is identified as the simultaneous presence of F and E (F . E).

Therefore:

F(1) . E(0) = 0 [7]

From the logical point of view then, there is no difference between deception (E) and irony.

According to the application of the proposed logical analysis, an ambiguity is reached between deception and irony. Linguistic production does not allow differentiating these two situations, because there is no way to logically represent this difference, except by presupposing the induction of inferences in the listener, through implied premises (implicatures) conveying implied conclusions (Sperber and Wilson, 2004, p. 252), which is absolutely arbitrary since it extrapolates to a

psychic event the conclusions derived from an analysis of *logical thinking.* It should be clarified that in this analysis the context has not been considered; an aspect that in the theory of relevance is "fabricated" (it is *ad hoc*) following the same logical guidelines as in the case of thought.

What are the possible causes of this ambiguity?

1. A hierarchical, transitive, and binary arrangement of information, by adhering to classical logic, which makes it static.

2. A problem with the identity of each situation. Only the quantitative aspect is considered, where both situations are the same, to the detriment of the qualitative aspect, where they differ. In other words, in spite of dealing with the ostensive intention and the inferential, the subject is excluded (remember the non-designation of classical logic), considering only the object.

3. Not considering time, which is the only way to certify simultaneity. Deception and irony are seen as two photographs taken at a time t_n . Then, "you see 00" and it is considered as 0, for doing it sequentially, instead of "seeing 01" if they were considered simultaneously.

4. The metaphorical basis of cognitive sciences, which is updated with the following anonymous expressions extracted from computer jargon: "*Computers are not intelligent, they just think they are*"; "*Computers are one of those obnoxious devices that never do what we want them to do, only what we tell them to do*"; "*If you torture data enough, they will confess*"; "*Spend enough time confirming a need and the need will disappear*"; and finally, one with an appropriate ironic tone: "*The confusion is crystal clear*".

What does transcurssive logic contribute to the case of irony?

Linda Hutcheon in her peculiar book "The edge of irony" (1995) characterizes the ironic sense by saying that it is relational, inclusive, and differential (Hutcheon, 1995, p. 58). She says it is relational because irony is a strategy that relates not only senses (he said, he did not say), but also subjects that act as interpreters and at the same time as generators of the ironic.

The ironic sense, says the author, arises as a consequence of a dynamic relationship between different generators of meaning in order to create something new. In other words, she suggests the provocative image of a complex phenomenon of "tension" between "the said" and "the unsaid", each of which takes on meaning in function of the other. Moreover, it does not pose this relationship on equal terms, but on the contrary, the power of "the unsaid" as a challenge would be the fundamental semantic condition of irony.

Wittgenstein refers to inclusiveness, giving as an example the illustration of the famous "rabbit-duck" published by Wittgenstein in his "Philosophical Investigations" to show an optical illusion where the figure can be interpreted as

a duck if the two appendages coming out of it to the left are assimilated to a beak; or as a rabbit, if they are interpreted as a pair of long ears (Figure 7).

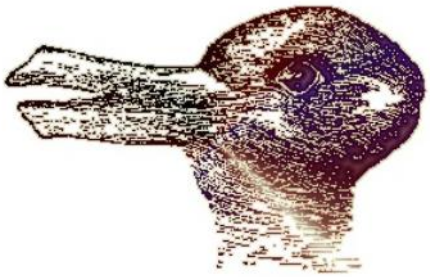
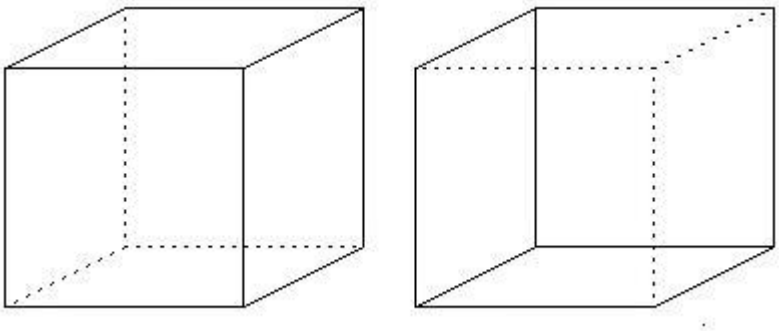


Fig. 7 Wittgenstein (1999, p. 172)

The philosopher mentions that we cannot experience both readings at the same time. Hutcheon instead suggests, that if these figures are interpreted as components of an ironic situation, our mind could "see" them at the same time (this is an identical position to the one adopted when we analyzed Necker's cube from the LT - Salatino, 2012, p. 406).



Necker’s cube

Posed as something dynamic, it suggests that there could be in the ironic a rapid oscillation between "the said" and "the unsaid" and although this overview does not allow us to weight as more relevant any of the components, this "mixture" of semantic senses, although separated by the subtle "edge of irony", allows us to get an idea of the ironic sense as governed by change and not as something static.

The global, in short, poses it as the need to abandon the restrictions of the standard semantic notion of irony, which proposes it as an "inversion". That is, as formed by two opposing and substitutable counterparts. "Ducks are not the opposite of rabbits", they are simply different. We can speak of incongruence, the author asserts, but this incongruence cannot and should not be assimilated to contrariness.

Both terms must be perceived together and only separated by a "net edge" that allows comparison so that the incongruity can be considered ironic; can be tolerated, we would add.

Hideki Hamamoto in his article "Irony from a cognitive perspective" (Hamamoto, 1997, p. 257) proposes a model of the cognitive aspects of irony. In it he indicates that in irony there would be two cognitive components: a prior knowledge arising from the superficial (apparent) reality and generating expectations or predictions; and a subsequent one or recognition that typifies a certain phenomenon as effectively real. The fundamental element of the ironic phenomenon would be the discrepancy between recognition and prior knowledge (or expectation), which would correspond to the concept of "tension" proposed by Hutcheon. The difference between the "knowledge of irony" and its "linguistic form" is due to a difference of levels: one non-linguistic and the other linguistic, although one is not necessarily the negation of the other.

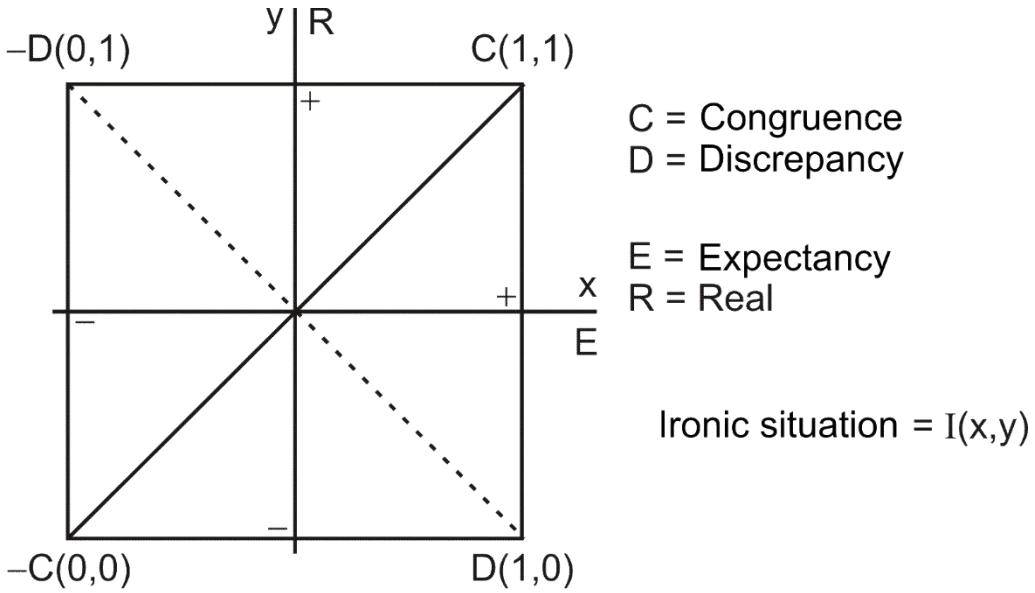


Fig. 8 COGNITIVE FOUNDATION OF IRONY
(modified from Hamamoto, 1995, p. 265)

Hamamoto, in 1995, proposes a scheme (Figure 8) in which he attempts to systematize the cognitive basis of irony. In this scheme, on the -C/C axis there would be no discrepancy between E (the expected) and R (the real). In Hutcheon's terms, there would be no "tension" between them. On the other hand, there would be discrepancy between the two levels along the -D/D axis.

The mechanism at the cognitive and linguistic levels would work by contemplating four basic ironic modalities:

1) The standard or prototypical, the same as that adhered to by Grice (1995, p. 53).

Linguistic level: 1 (something is asserted as real)

Cognitive level: 0 (opposite thought)

... ***Maximum Discrepancy***

2) Where the dissolution of a situation is involved. The speaker expresses verbally the perception of discrepancy between expectation (E) and reality (R).

Linguistic level: 0 (discrepancy suggested)

Cognitive level: 1 (it is known that reality is the opposite).

... ***Minimal Discrepancy***

3) Here the real state (a true situation) is described as it is.

Linguistic level: 1 (solution to the ironic situation is proposed)

Cognitive level: 1 (reality is thought of as it is expressed)

... ***Maximum Congruence (irony cancelled)***

4) The case of unintentional ironic statements arises.

Language level: 0 (unintentionally says something ironic)

Cognitive level: 0 (does not perceive incongruent reality)

... ***Minimum Congruence***

5) The author proposes a possible ironic situation that is superimposed on the first in terms of the binary code that characterizes it, but in itself represents an inverted situation. In the first modality, reality turns out to be the opposite of what was said, so that the listener, realizing the incongruity, generally returns to utter the same expression heard but with a different intonation to make the irony evident. In this case of inversion, all this is done at once, that is to say, the listener, knowing the negative reality beforehand, expresses it positively in an ironic way.

The functioning of Hamamoto's scheme, as we have described it, constitutes a Galois connection[10] , that is, an opposition mediated by another opposition identical to the one indicated as the pattern of our PAU and as such, to the nucleus of universal language, as well as to the dynamic structure of a *species*. The latter is transcendent because it transforms irony into a sort of "rosetta stone" or "semiotic trilobite" (if I may use the term) that allows us to unravel, in some way, the reason for our thoughts and ideas and how everyday language masks or distorts the subjective reality that our natural language intends to communicate, when it passes through the psychic filter. This gives absolute meaning to the expression we coined at the beginning of this section: "irony is the only symbolic structure that brings thought to the surface".

[10] *Galois connection*: roughly speaking, it can be said that it is a particular way of opposing two concepts through another opposition. If two concepts belong to different categories and one of them is better known, through Topology a homomorphism can be established between both categories (i.e., compare them). If we take two pairs of concepts, which are seen in each pair, as opposite functions, and if in one of these pairs, for example: subject - object, we want to establish a relation of concurrent opposition, that is, where both elements, despite being exclusive for classical logic, are present at the same time, we can oppose them through another opposition of the same characteristics. This allows their comparison and the establishment of the algebraic structure discovered by Galois in 1832: the *group*. This *group* fulfills a series of characteristics that validate the pertinence of the comparison between these pairs and makes it possible to demonstrate that two concepts can be considered opposites without being mutually exclusive. This interpretation of the *Galois connection* makes it possible to establish a relationship between the objective (the known) and the subjective (the unknown), thus suggesting that the subjective should also correspond, in some way, to the real facts.

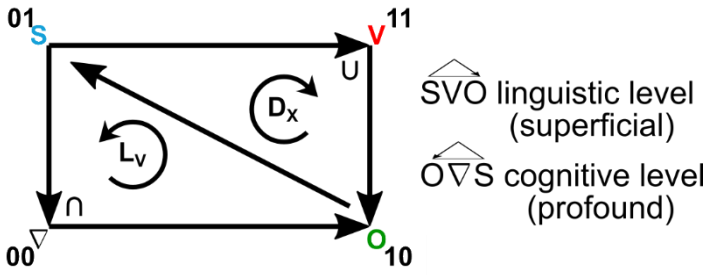


Fig. 9 FUNDAMENTAL LOGICAL CORE OF IRONY
References: ∇: noV or subjective change - V: objective change - S: subjective subject/objective subject - O: subjective object/objective object - ∪: union of differences - ∩: intersection (separation) of similarities - D_X : dextrorotatory (clockwise) or superficial turn - L_V : levorotatory (counterclockwise) or deep turn - SVO: superficial (linguistic) triad - O S: deep (cognitive) triad - 01, 10, 11, 00: basic ironic modalities.

As can be seen in Figure 9, the correspondence between the proposed scheme and the *species*, from the logical point of view, is absolute. In the scheme, the two operative levels of irony can be individualized. On the one hand, the dextrorotatory (D_X) or SVO representing the conventional or superficial linguistic level and corresponding step by step with the structural or volitional of the *species*; and on the other hand, the levorotatory (L_V) or O∇S representing the level of cognition or deep and strictly related to the functional of the *species* or that which constitutes the prolegomenon of thought, that is, of cognitive activity itself.

The operation of our scheme of irony is very simple if one accepts, for example, that the superficial level can be "translated" directly into the pure linguistic, as it constitutes the expressive scheme adopted by Aristotelian logic, where the statements about the attributes of a substance are stated in a natural way in singular propositions of the form of the subject-predicate (Stebbing, 1965, p. 529). It should be remembered that the surface level is that of monocontexture or binary, the one that strictly conforms to traditional logic and the only one that actually addresses the *theory of relevance* (as well as any other linguistic theory). On the other hand, the relationship between the elements of the surface level is the one that appears in almost any idiomatic expression, at least in our Indo-European languages: S = subject, V = verb (action) and O = object.

As for the deep level, its state, it derives from the transcurssive logical operations (Salatino, 2017, p. 225) through which one can "register" all the basic ironic variants and transit through them, thus synchronizing, with the different moments of psychic functioning.

In the ironic variant (1) the focus is the object or the quantitative (the appearance), in the ironic variant (2) it is the subject or the qualitative through the affective, in the ironic variant (3) the union (∪) of the elements of the previous situations is considered where, however, the "edge of irony" is respected through a logical disjunction. In this way, the dynamic aspect is validated, since the main focus is the evident change, that is, the superficial irony or that which the linguistic elements make evident. Finally in the ironic variant (4) where the intersection (∩) between the elements is eluded by means of a logical conjunction, which although deep, revalidates a category that makes it lose the ironic intention to the situation. For this reason, its focus is the profound change, that which without

being evident, operates in a hidden way a situational reorganization that emerges untimely, in spite of its producer, transforming itself into an evident modified action and allowing the interlocutor who notices the non-intentionality, to take pleasure in the ironic, while its producer (who may well be an autistic), does not perceive the irony or the double meaning as such, because he lacks the proper affective tone.

Irony, observed from a psychic-structural and dynamic point of view, allows transcurssive logic to propose the scheme shown in Figure 10 to explain the double process of linguistic comprehension/production.

The ironic situation, whatever it may be and like so many others, is typically heterarchical, that is to say, it operates at different levels simultaneously and therefore, its approach from the monocontextural logic (binary or classical) is, to say the least, difficult.

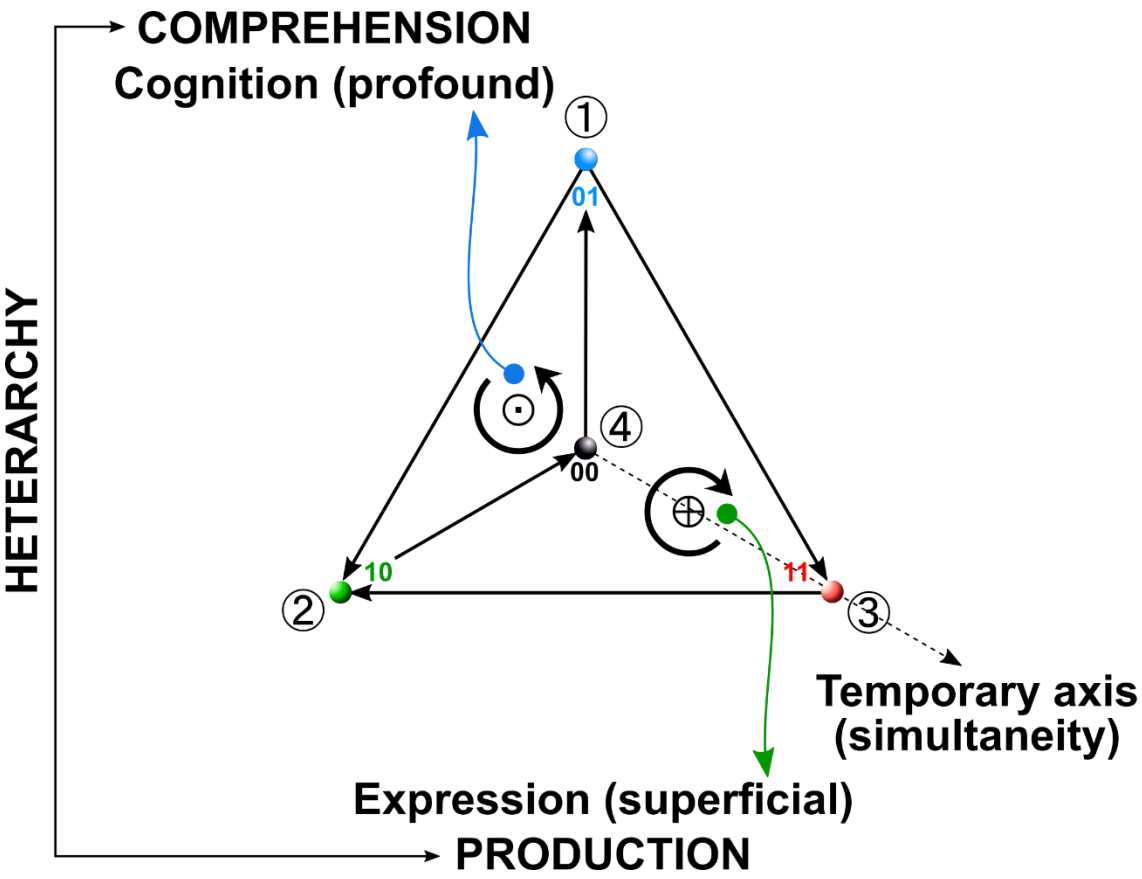


Fig. 10 PSYCHICAL MECHANISM OF LINGUISTIC UNDERSTANDING/PRODUCTION
References: ⓪,① ,② and③ : monocontextures

We have seen that in the ironic approach the traditional logical operators of conjunction (*and* logical), disjunction (*or* logical) and negation are used, but the efficient way to deal with a complex situation like this, where the producing subject cannot be left aside, is to handle in a generalized way the conjunctive and the disjunctive and in a polycontextural way the negation, as transcurssive logic does, when contemplating such typically subjective aspects.

The processes involved in a speech act (as proposed, but not solved by Searle in 1986) and in all overt communication are now broken down from the above

proposal. In other words, what is thought, the intention it entails and the effect it produces through comprehension and production, respectively.

Through the generalized conjunctive (equivalence: ≡) the understanding is focused by synchronizing from the psychic structure (ideas or representatives of external time), the psychic function (or thoughts) whose substrate is the transcurssive negation that operates internal time. Through the generalized disjunctive (exclusive disjunction: XOR) the production of linguistic expressions is operated.

The parallel and simultaneous operation of these two circuits is a possible model of a distributed circularity of a system in its environment, which oscillates, as in Hutcheon's proposal, between both levels: superficial and deep, although respecting the "edge" (the border) that links the subjective and the objective.

A possible functioning would be taking of stimuli (signs), from the surface through a meaning, creating psychic structure through ideas by registering them in the depth, inserting them in the history of the subject (generation of an operative sign - PAF (Fixed Action Pattern). Then a meaning is elaborated that arises from the understanding of the meaning (of a sign), forming a symbol by establishing itself functionally in thought, to later re-emerge on the surface as a symbolic linguistic expression that is the bearer of a new meaning, an intention and a facilitation to achieve a certain effect in the environment, but without relation to any psychic structure or process. The child suffering from some variant of ASD, by only having the possibility of relating 'two objects' through an internal change (and not a subject and an object through an external change) (Salatino, 2021), there is a 'social disconnection' that sustains something like an 'inward motivation', ignoring the existence of the requirement that someone from the environment makes to him/her.

7.0. CONCLUSIONS

In this paper we have critically reviewed some contributions that the cognitive sciences have made to the subject of language comprehension, in order, from there, to justify the benefits assigned to ToM. The inappropriateness of the model analyzed, perhaps we should look for it in the fact that the subjective aspects of language are a research topic long neglected by science in general and by linguistics in particular. From general science, because its objectivity proscribes the approach to the subjective, and from linguistics, because it adhered without concessions to the cognitive sciences by becoming part of them. The concept of "mind" was, paradoxically, key in the promotion of this neglect, as it emerged as the "gold standard" of the cognitive sciences, against behaviorism.

In the 1960s, and basically, with the help of the then recently created cognitive psychology and influenced by the nascent computer revolution, leaving aside the brain (the biological aspect), the "mind" (supposed basis of the subjective) was conceived as a collection of computer programs that handled symbolic operations (never explicitly detailed), whereas is reasonable, there was no place left for the subject and its avatars. This could be understood as a collection of computer programs that handled symbolic operations (never explicitly detailed), whereas is reasonable, there was no place left for the subject and its avatars. In this way, an

unbridgeable division between the cognitive and the volitional was produced, which in the end constituted not a rejection, but a purified model of behaviorist psychology in which the psyche was not taken into account.

The cognitivist proposal changes the behaviorist stimulus-response pair for the informationist *input-output* and nothing more. As Bunge would say:

> "*The advantage of this widespread view is obvious: since its practitioners do not stick their noses into brains or even peek into them, they do not have to handle laboratory paraphernalia or dress in scrubs. They are not even required to read neuroscience publications. All they have to do is 'study what's in the mind' (their own mind)*." (Bunge, 2004, p. 230)

Bunge himself (Op. cit.) points out, very concretely, the evident errors that this narrow vision of the subjective aspects entails, among which we will mention: i) It confuses the mind (brain) with the conceptual models that allow simulations in a computer. This is like accepting that a surgeon, when opening a patient, would find full color plates like those drawn by Testut, instead of real organs, vessels and blood; ii) It assumes that man is a symbolic processor, which destroys everything subjective that supports the linguistic expression, ignoring that the symbolic of language does not even have its origin in sub-symbolic processes (as suggested by Bunge), but pre-symbolic or thoughts as they are catalogued in this research. The symbolic is not built from concepts, but from notions that when incorporating time (internal) become thought and all this is based on considering the subject as the implicit particular-universal, bearer (in its subjectivity) of the universal language of reality, and iii) It does not explain any mental process, a "flow chart" has nothing to do with any mental process.

Concluding then, for Chomsky (the most charismatic founder of cognitive sciences) and all his followers, the mind is immaterial (unreal) and therefore, not only has nothing to do with the brain, but also nothing to do with the subject carrying that brain. This situation resulted in a psychology and all the subspecialties that derived or use it until today, which could be freely ascribed to a modularity of the mind (introduced by Fodor in 1983), enormously popularized as a basis for the interpretation of the origin and functioning of language, by evolutionary psychologists such as Pinker (2001, 2003, 2007), 2003, 2007), who, beyond the controversy unleashed with Fodor over the computational aspect of the mind, became, together with other *best-sellers* in the cognitive sciences, one of the main disseminators of this limited conception of the subjective that was born in practice, since the pioneering work of Chomsky.

In the 1980s, an alternative to the informationist vision emerged, connectionism, which, although we could not say that it replaced it, is perhaps the most relevant today.

This new current, which has its roots far back in time (in the work of W. McCulloch and W. Pitts in 1943), was based on the "construction" of artificial neurons and their subsequent connection in an attempt to simulate brain functioning. The first artificial neuron (Rosenblatt, 1961) served as a spur, not for neuroscientists as expected, but for those engaged in computation and only belatedly, when this type of development reached an important level thanks to a better understanding of its possibilities (Minsky, 1967), did it spread to the field of Artificial Intelligence and also reached, to stay, the linguistic field (Hudson's conceptual networks (1984); Lamb's (1999) non-symbolic networks).

It is true that connectionism is more firmly tied to the brain than informationism, but even in the case of linguistic applications that pretend to detach themselves from strictly computational applications, it is still a reductionist approach in the extreme and induces profound misunderstandings.

Thus, as we said earlier that man is not a symbolic processor, we must say that man's brain is not a collection of "all-nothing" logic gates. That is yes, neural networks. They are simply mathematical models very cleverly designed to comply with the basic formalisms of binary logic. As such, then, they cannot handle any subjective aspect, no matter how much they are 'humanized' today by approaching them from the localizationist hypothesis of mental functions that, according to their advocates, has been "amply confirmed"' by contemporary neuroscience through modern diagnostic methods using computerized brain imaging such as Functional Magnetic Resonance Imaging (fMRI). (Lamb: 2004: 227-53, 254-76; 2006: 4; 2009 on Internet). These confirmations lose reliability when publications such as "*Broca's area and language instinct*" (María Cristina Musso et al., Nature Neuroscience 6, pp. 774 - 781, 2003), where the probable existence of the center of universal grammar (proposed by Chomsky) in Broca's area is 'demonstrated' (in a very unscientific way) by the same means (fMRN); something totally different from what the studies on which Lamb's (1999) and even Bunge's (2004) assessments are based claim to demonstrate, which only provide us with information about where, supposedly, things happen in the brain, but not about what happens there, so that the existence of a ToM can hardly be defended.

Nor does Lamb's proposal, which suggests that the brain processes of language cannot be understood without understanding linguistics, that is, the functioning of the neural structures dedicated to language processing cannot be understood if linguistic aspects are not considered, constitute a contribution to the understanding of the subjective phenomena of language. Then, based on the "evidence" obtained from neuroscience and combining it with the "evidence" coming from linguistics, it would be possible to build a bridge between neural networks and linguistic networks (Lamb, 2009). The disadvantages of this proposal derive, on the one hand, from the fact that the supposed linguistic networks have a foundation that in no way distinguishes them from artificial neural networks and, on the other hand, that it is declared complementary to analytic linguistics (which includes Chomsky's generative grammar, lexical-functional grammar (a variant of the previous one), cognitive grammar, among others), attempts to describe linguistic data while neurocognitive linguistics (as Lamb's proposal is known today), examines linguistic data as "evidence of a cortical information system structure" or that the analytic stream tends to see words and other linguistic units as stored objects or symbols and neurocognitive linguistics, on the other hand, sees linguistic units in terms of connections distributed in a network, among other similar observations.

With all this, we want to show that the cognitivist approach (whether informationist or connectionist) does not contemplate any subjective aspect of language that would allow it to talk about comprehension, much less about 'guessing' the intentions of others, just by analyzing their expressions. Moreover, far from this, it tries to continue demonstrating (supported in one way or another by the computational metaphor) that language is based on logical aspects that allow it to be simulated by a computer in order to explain its possible functioning, an

inferential mechanism that is totally divorced from the reality of natural human language.

In contrast to the above, we based our understanding of natural language on psychic structure and function. This approach allowed us to define how our brain carries out cognitive activity through a basic logical-relational structure: the *species*. The "identity processes" that occur there, allow the emergence of an authentic understanding of a certain fact, that is, when using thought to make sense of something, something that the autistic person, having a distortion of his psychic structure (Salatino, 2021), cannot do.

The understanding of language could then be equated to a type of complementation between the volitional and the cognitive, which allows us to express the meaning found in a fact by means of an action. That is to say, provoking in the psyche or in the immediate environment, a transformation. The autistic, with his resistance to change (given his social incapacity), cannot carry it out.

We were also able to see that it makes no sense to try to understand a simple code, such as conventional language. On the other hand, natural human language must be understood in order to become a true expression of thought. The reason for this sharp difference is to be found in the "logical vices" in which science incurred from the hand of categorization, the operative nucleus of cognitivism.

Transcurssive logic provides an interpretation of the communicative process based on genuine psychic mechanisms (properly subjective), where the place of the phenomenon of comprehension can be verified, and thus explain why a child with ASD does not 'understand' language.

With a pragmatic intention, irony was used as a model of understanding, in an attempt to decipher, from the empirical, its exquisite mechanism, while dismissing the use of binary logic (logical thinking), to achieve the same objective. In this way, it is made clear that all the models of understanding language, currently in force, suffer from the distortion that a supposedly objective approach to science imprints on them. Furthermore, it was possible to demonstrate where the 'inability' of children with ASD to grasp the 'double meaning' of a verbal expression lies.

As a corollary then, we do not intend to discard the achievements made by the cognitive sciences in the diagnosis and treatment of children with ASD, but we suggest that the subject should be investigated from other points of view, in order to bring their diagnosis even closer and to elaborate aid plans to combat the socio-communicative deficit of these children, based on a better elaborated scientific support.

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